DOCUMENT RESUME

ED 219 540 CE 033 190

AUTHOR Lynch, Edward J.
TITLE Training for High Technology at Macomb Community College.
PUB DATE 19 Jul 82
NOTE 9p.

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Computer Assisted Instruction; Computers; Educational Cooperation; *Educational Needs; Educational Objectives; Educational Practices; Electronics; Industrialization; Information Processing; *Job Skills; *Labor Needs; Outcomes of Education; Program Descriptions; *Program Development; Program Effectiveness; School Community Relationship; School Role; Skill Development; *Technical Education; *Technical Occupations; Technological Advancement; *Two Year Colleges; Vocational Education; Word Processing
IDENTIFIERS Industrial Robotics; *Macomb County Community College MI; Michigan

ABSTRACT

Macomb Community College (MCC) prides itself on its responsiveness to the needs of area industry for skilled tradespeople to engage in the design, tooling, and machining activities that are crucial to the area's long-standing automobile and manufacturing operations and to the needs of new area high technology and service-oriented industries. The ability of MCC to offer over 90 programs to meet student and community needs is due largely to its talented and conscientious faculty and staff as well as to its overall college climate that supports faculty efforts. This quality and relevance of MCC's programing is affirmed by its continued accreditation by professional associations, its high success rate on professional state exams, and the job market success of its graduates. Included among those of MCC's programs that are particularly significant to Michigan's efforts to attract high technology industries are completely redesigned programs in electronics and business data processing and new programs in computer-aided design, robotics technology, and word/information processing. In addition to these courses, which incidentally provide hands-on experience as well as classroom instruction, MCC is developing a basic skills component and non-traditional short-term and quick-start occupation specific courses/programs. (MN)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
This document has been reproduced as received from the person or organization originating it.
Minor changes have been made to improve reproduction quality.
Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
E. J. Lynch
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

ED219540

TRAINING FOR HIGH TECHNOLOGY AT MACOMB COMMUNITY COLLEGE

The challenge to the vocational education community to provide occupation specific training for the 1980's and 90's is a tremendous responsibility. Nowhere is the challenge more crucial than in the state of Michigan where the fortunes of the state have long been tied directly to the economic health of the automotive industry.

Michigan's success in diversifying its industrial base and in attracting new "high technology" industries and service oriented businesses will require a massive retraining and upgrading effort. (For programming purposes, the author considers high technology to be a knowledge-based process utilizing a relatively intensive concentration of technical skills and scientific knowledge integrated within the production system.)*

Michigan companies and agencies are and will continue to be among the largest users of the most technologically advanced equipment because of the automotive and other manufacturing industries. A study released in June of this year by the Congressional Joint Economic Committee concludes that the mid-western section of this country stands to gain the most significant increase in high technology firms. The study, which was based on responses from 691 high technology companies, identified labor markets and academic institutions as the two major attractions of this section of the country. Michigan with both the skilled and unskilled labor, as well as an outstanding higher education system can become a leading high technology state.

We are already beginning to profit from these two assets. Fifteen major robot manufacturing companies are currently located in the state. The recently announced joint robotics venture between General Motors Corporation and Japan's Fujitsu Ltd. will manufacture its products here.

The result of the automotive industry being both capital and labor intensive results in an area labor force that has two distinct levels: great numbers of unskilled workers required to accommodate the needs of the assembly process and additional large numbers of skilled tradespeople providing the talent absorbed in the design, tooling and machining activities.

* Based on a definition credited to K. Nagaraja Rao of M. I. T.

CE033190

The increasing use of tools such as computers, robots, and information processors require a workforce that operates with more mental effort and less physical effort. The shrinking market for unskilled workers in the mass production process will be accelerated by the current recession in Michigan's major industrial and construction sectors. When Michigan's economy is back in full swing it will require fewer assembly line workers and more skilled technicians. The already highly skilled technical segment of the workforce in Michigan will require upgrading to operate, maintain and service this new level of technical equipment. The greater training task may be to provide currently unskilled workers with skills which will allow them to function in tomorrow's work force as well as in today's. Included too is the task of providing for the retraining of those individuals whose current skill area is now or will become obsolete in the near future.

Macomb Community College, a multi-campus institution, with an enrollment of over 30,000 students, is the largest of the states 29 community colleges, and is second to none in its market-place orientation. Enrollment parallels that of the state with over 51% of its student body enrolling in occupational programs. Our primary service area is a highly industrialized county located in the Northeast portion of the metropolitan area surrounding the city of Detroit.

Because of its heavy reliance on the automotive industry, Macomb--of all of Michigan's counties, needs to actively participate in state efforts to revitalize and diversify its economy. No community college in Michigan is better positioned by virtue of faculty, staff, facilities and commitment to be of meaningful service to its community. No college has a better opportunity to be of maximum service to its community. The president of Macomb Community College, Albert L. Lorenzo, is fully committed to putting the total college resources behind this effort. He has led efforts to identify and promote the resources of MCC, and also the state's total community colleges' resources to play a key role in the state's economic revitalization.

The relationship MCC enjoys with its community is no accident. It has been developed over 27 years through a variety of college activities designed to

be of maximum service to our community. It enables us to be on the cutting edge, designing and providing the training required to enable the business/health/industrial communities to employ new technologies as they are developed.

Through our credit and non-credit courses/programs, apprentice instruction, contract education activities and a college-wide "Task Team on Economic Development", appointed last year by President Lorenzo, we now serve an employer base of over 500.

Macomb added nine new occupational programs this year and significantly modified sixteen others to ensure updating of materials necessary to optimize employability opportunities for program completers. This brings to over 90 the total programs available to meet student and community needs. They are distributed in the areas of Business, Health, Public Services and Technology.

There are a number of reasons why Macomb has been able to and will continue to accomplish these outstanding programming results. Two, however, in my judgment, stand out above the rest.

First, MCC has a talented, well-educated faculty and staff who are willing to make the effort necessary to see that programming remains current. This they accomplish by advanced study in their field plus a number of other activities including:

- participation and leadership roles in professional associations
- interaction with a large staff of adjunct faculty selected from active career professionals in business, industry and the professions
- meaningful and current understanding of the employer's need accomplished in part thru visits to the job site and discussions with employer representatives, with program graduates and advisory committees
- faculty supervised co-op/intern/clinical experiences for students
- a large, strong program providing related instruction for industrial apprentices

The second significant reason for Macomb's successful programming efforts is an overall college climate that supports faculty efforts. This support is demonstrated in actions as well as words. For example, the college has

invested approximately two and one-half million dollars in equipment for occupational programs in just the past five years. The college opened two additional facilities this Fall to house occupational programs. This adds 135,000 sq. ft. to the previous total of 862,000 sq. ft. of permanent physical plant. One of these new buildings will house Health and Human Service programs, the second will accommodate new technology programs and allow for expansion of others. A unique design feature of the new technology building is that it will receive approximately 50% of its energy from the use of solar. To take advantage of this feature, the instructional space has been interwoven with the building design, enabling the faculty to employ the building itself as a laboratory.

Evidence of the quality and relevance of Macomb's programming includes continuing accreditation by professional associations, and its high success rate on professional state exams. Additionally, the Robotics Division of General Motors recently employed five technicians from among almost two thousand applicants. Four of the successful candidates had completed Macomb's Fluid Power Technology program.

In a recent survey of Macomb graduates who had then been in the job market from three to five years, 97% of the respondents said their career had been advanced because of courses completed at MCC. Seventy-four percent of these graduates rated Macomb job training as above average. Equally significant was the fact that these graduates showed unemployment ranging from 4.5 - 7%, substantially below the surrounding six county range of 13 - 14.4%.

The new programs introduced this year then are additions to an already strong group of programs which are clearly meeting crucial testing in the job market.

Because of the talent of Macomb's faculty and its commitment to currency of programming, our college has frequently been among the first to offer timely new career programs. The past few years have not been an exception.

There are a number of programs which are particularly significant to

Michigan's efforts to attract high technology industries. Two of the earlier programs, in Electronics and Business Data Processing, were totally redesigned and updated within the last few years. An additional one-quarter of a million dollars was invested to update equipment. New programs in Computer Aided Design, Robotics Technology and Word/Information Processing were designed to meet the need for technicians trained to work with these new tools.

These three programs have a number of things in common. In each, the faculty asked for and received active and positive assistance from business and industry in determining the performance objectives necessary for curricular design, as well as assistance in equipment selection.

Student demand in each of these three new programs exceeds our ability to accommodate it, due to limited lab facilities, equipment, or a shortage of qualified faculty. To accommodate as many students as possible, courses in these programs generally are scheduled from 7 a.m. to 11 p.m., Monday-Friday, and from 8 a.m. to 6 p.m. on Saturday. The Word/Information Processing program also utilizes most of Sunday as well. Each of these programs was built upon available strong courses thus keeping to a minimum the need to develop completely new courses.

Interactive Computer Aided Design

Local industry began several years ago to incorporate this advanced design technology into their operations. Rather than developing a separate stand-alone program, the college decided to integrate CAD/CAM into our traditional drafting and design curricula. Course development combined conventional drawing theory and methods with the use of an interactive CAD/CAM system.

Students first take prerequisite courses in Drafting Survey and Drafting Practices. They then take Computer Graphic Views and Grids, and a course in their particular specialty design areas, such as Body Drafting Application. Each of the Computer Graphic courses includes eight hours of classroom instruction and eight hours of hands-on experience. The Auto Body Design program, one of the

five design specialities offered at the college, includes ten Computer Graphic courses resulting in each student receiving a total of 160 hours of computer graphics instruction; 80 hours of which are in actual operation of the colleges' computer graphics system.

Professor Jack Thompson was the college point man in this entire process, which began in 1978. He and Professor Gene Hauer have been the guiding forces in the development of CAD at Macomb. Professor Thompson served as chairman of the committee which prepared the specifications used in the bidding process, reviewed the bids and made equipment recommendations. The committee included faculty from the eight-member full-time design staff, administrators and representatives from several of the area firms representing a cross section of users.

Macomb Community College purchased and installed its Computer Graphic system with four terminals (includes one color) in 1980 at a cost of almost $400,000. By the Fall of 1983 it is anticipated that student demand will require scheduling the lab around the clock, six days a week.

Robotics Technology

The first courses in Robotics were introduced in the summer of 1980, after two years of meetings with representatives from area industrial firms, as well as vendor companies. Professors Floyd Brown, Bob Dueweke and Ed Konopka developed an Electro Mechanical certificate program for the upgrading of various categories of industrial journeymen. A separate associate degree program was introduced in the Fall of '82. This later program draws from students whose background ranges from individuals with advanced degrees to students who did not complete high school. It is designed to prepare technicians for a wide range of related jobs, including opportunities as installers, repairmen, programmers, design and application technicians.

Students completing the two year program will have a varied cross-section of coursework--electronics, hydraulics-pneumatics, math

and physics. They will have met competency standards for professional certification by such organizations as The Society of Manufacturing Engineers/Robotics International, Robotics Institute of America, and the American Fluid Power Association.

Prerequisite courses in electronics, hydraulics, math and physics are required before the student is eligible to elect specific Robotics courses. An anticipated future change is the incorporation of supervision and management courses.

Current college investment is about $450,000. The lab space was increased substantially this Fall and approval received to add another full-time faculty member, allowing for some increase in the number of students enrolling in the program.

The future market for individuals with this training, while expected to be large, still remains cloudy--due in part to the pristine nature of the industry and the current economic climate. Macomb Community College, along with two other Michigan Community Colleges is working with a grant from the State Vocational Education department to evaluate the future of the robotics market in Michigan, and, specifically, the numbers and types of anticipated job openings.

Word/Information Processing

Professors Chris Belles and Dee Shankie began the development of this program approximately six years ago. The ability to increase productivity in the office brought about by the new information processing equipment required skill training built upon--but surpassing the traditional skills required in the office.

The program combines hands-on training in information processing, concepts and procedures in office automation, with related courses in General and Business Education. Students completing the program are prepared for entry positions as word processing specialists and for advanced word processing positions in coordination, supervision and management. Future considerations for this program include a

closer relationship with the computer terminals used for traditional "data processing". This would match the apparent trend of the industry.

The college's recently expanded lab facilities utilize various types of electronic word processing equipment, worth well over $100,000. While students spend most of their time on disk-terminals, they also learn to operate card and tape devices.

A unique scheduling feature of this program, and one which is similar to the Computer Aided Design program, has students meeting about one-half of class time in lecture. The balance of the time the student schedules in the lab working on his/her own with the various word processing devices.

At MCC we are making other significant programming changes and adjustments required to accommodate High Technology, for example:

- The basic skill level of a large percentage of those recently unemployed as a result of technological change is very low. Before they can retrain in one of the emerging technological fields with the hope of continued future employment, they require an upgrading of basic reading, writing, and math skills. Macomb is developing a Basic Skills component to assess and program these students on an individual basis.
- We are expanding non-traditional short-term and quick start occupation specific courses/programs required to meet employer needs.

Macomb Community College is committed to providing training and education needed to accommodate new technologies as they emerge. The role for Michigan Community Colleges has never been more clearly identified--and we are ready.

by: Edward J. Lynch, Dean
Occupational Education
Macomb Community College

EJL/pan
7/19/82